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March 12, 2019

Ms. Renee Wawczak
U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, Illinois - 60604

Send Via E-mail
(Wawczak.renee@epa.gov)

Dear Ms. Wawczak:

Re: Laser-Induced Fluorescence Perimeter Investigation Work Plan – Phase I
Former East Chicago Refinery and the CITGO Terminal – East Chicago, Indiana

On behalf of CITGO and Glenn Springs Holdings, Inc. and OXY USA (collectively, OXY), this Site Perimeter Investigation Work Plan (Work Plan) has been prepared as the initial investigation phase for the project. The project area includes an active petroleum distribution terminal operated by CITGO (an approximately 300+ acre parcel) and the former Cities refinery property (approximately 93 acre parcel). The refinery was closed in the 1970s and demolished shortly afterward. This Phase I Work Plan scope includes completion of a laser-induced fluorescence (LIF) investigation borings around the perimeter of the approximately 400 acre Site.

CITGO and OXY are proposing to conduct a joint perimeter assessment under the Administrative Orders on Consent (AOC) for each of the sites, which are currently being negotiated by CITGO, OXY and the United States Environmental Protection Agency (USEPA). While this assessment may occur prior to execution of the final AOCs, it is the understanding of OXY and CITGO that USEPA will consider the results of this assessment as an approved task under each AOC. This Work Plan also addresses a portion of the work contemplated under Section IV from the Draft Corrective Action Framework (Draft CAF) dated December 17, 2018 prepared by the USEPA. Section IV of the Draft CAF describes the performance of Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plans. This Work Plan will address a perimeter investigation (Phase I) utilizing LIF – a real-time field screening technology – to qualitatively detect polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds (VOCs) in the subsurface.

Consistent with previous discussions with USEPA, the initial approach is to investigate the perimeter of the Site. Based on the initial field screening results from the LIF investigation a follow-up scope of work (Phase II) will be prepared.

Phase I - Site Perimeter Investigation

a. Field Activities

A LIF investigation will be used to qualitatively screen potential impacts at the Site's perimeter. The LIF survey will be performed using Ultra Violet Optical Screening Tool (UVOST) system from Dakota Technologies. For more technical details on the LIF technology, see Attachment A.

The LIF probe is equipped with a sapphire window through which a laser is directed. The probe is advanced using a direct-push probe. The laser light is adsorbed by PAH molecules (e.g., anthracene, pyrene, benzo(a)pyrene, etc.) in contact with the window as the probe is advanced. This addition of energy (photons) to the PAHs causes them to release excess energy as light (fluoresce) as they return to ground state after excitation. A portion of the fluorescence emitted from any encountered PAHs is returned through the sapphire window and conveyed by a fiber optic cable to a detection system at the surface. The emission data from the pulsed laser light is averaged into one reading per one-second intervals and is recorded continuously. The emission data is reported as percent of the fluorescence intensity of a "reference emitter" (%RE). The Reference Emitter is a standard proprietary hydrocarbon mixture used to calibrate the equipment, and all LIF readings are a quantification of intensity relative to the fluorescence produced by it. For example, an LIF location producing a reading of 100%RE is fluorescing at exactly the same intensity as the standard hydrocarbon mixture. Other things being equal, LIF response is proportional to the amount of aromatic hydrocarbon present (i.e., LIF response is proportional to LNAPL saturation). In addition, the LIF instrumentation measures the intensities of four different wavelengths of light produced when a given LNAPL fluoresces. The proportions of each wavelength that comprise the overall fluorescence response are unique to a given petroleum product type and are referred to as the spectral fingerprint.

Following completion of utility clearance activities, the LIF probe will be deployed using a GeoProbe-type rig. As such, no soil cuttings will be generated during the LIF survey. Locations will be backfilled with cement-bentonite grout following the completion of each LIF push with the appropriate surface restoration. Locations will then be surveyed.

The LIF investigation is designed to be iterative and adaptive based on conditions encountered in the field. Initially approximately 59 borings will be advanced around the perimeter of the Site at an approximate spacing of 300 feet. The probes will be advanced vertically to an approximate depth of 15 feet below ground surface, as the water table is generally shallow, less than 5 feet bgs.

Figure 1 presents the conceptual layout LIF boring locations. LIF boring locations, sampling frequency and intervals may be adjusted in the field pending surficial conditions and/or utility locations. As part of this Work Plan, the following activities will be conducted:

- Prepare a Traffic Control Plan (TCP) for the project, as necessary
- Review information on known utilities
- Clear known public and private utilities
- Coordinate LIF boring locations with existing utility and property owners and as well as pipeline stakeholders
- Advance LIF borings around the perimeter of the Site
- Survey LIF boring locations for vertical and lateral control (Indiana West State Plane NAD83 horizontal coordinate system and the NAVD88 vertical datum).

b. Deliverables

A report summarizing the results of the Phase I LIF investigation will be prepared for submittal to the USEPA. As the LIF generates real time printouts in the field these will be complied and summarized in a series of tables

and figures as appropriate. A meeting will also be scheduled with USEPA to present and discuss the Phase I results. At the field meeting, it will also be determined whether additional LIF points are needed, or if the LIF investigation will be concluded and planning will proceed to Phase II, the installation of groundwater monitoring wells and soil sampling along the perimeter. The exact number and locations of further assessment work will be dependent on the initial LIF data. Currently we are estimating that approximately 15 groundwater monitoring wells will be installed during Phase II.

c. Schedule

The following presents a tentative schedule for the implementation of this Work Plan, following concurrence from USEPA that the LIF data will be usable prior to the AOC being fully executed or the CAF finalized. The following scheduled is based on an early April 2019 approval from USEPA:

- Within 4 weeks of USEPA approval to initiate the LIF project, utility clearance procedures will be initiated. Proposed LIF boring locations will be discussed with existing utility owners and pipeline stakeholders. This work is anticipated to be completed by the end of April 2019.
- As the LIF contractor has schedule availability we will mobilize to the field to conduct the LIF perimeter investigation. This is anticipated to be during May 2019.
- Within 4 weeks of the completion of Phase I field work, a meeting with USEPA will be scheduled to present our findings.

Closing

After your review and approval of this work plan, we are prepared to initiate mobilization activities following the proposed schedule. Please feel to contact me with any questions or comments.

Respectfully submitted,

GLENN SPRINGS HOLDINGS, INC.

David Sweeten

David Sweeten, OXY Project Coordinator

cc:

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